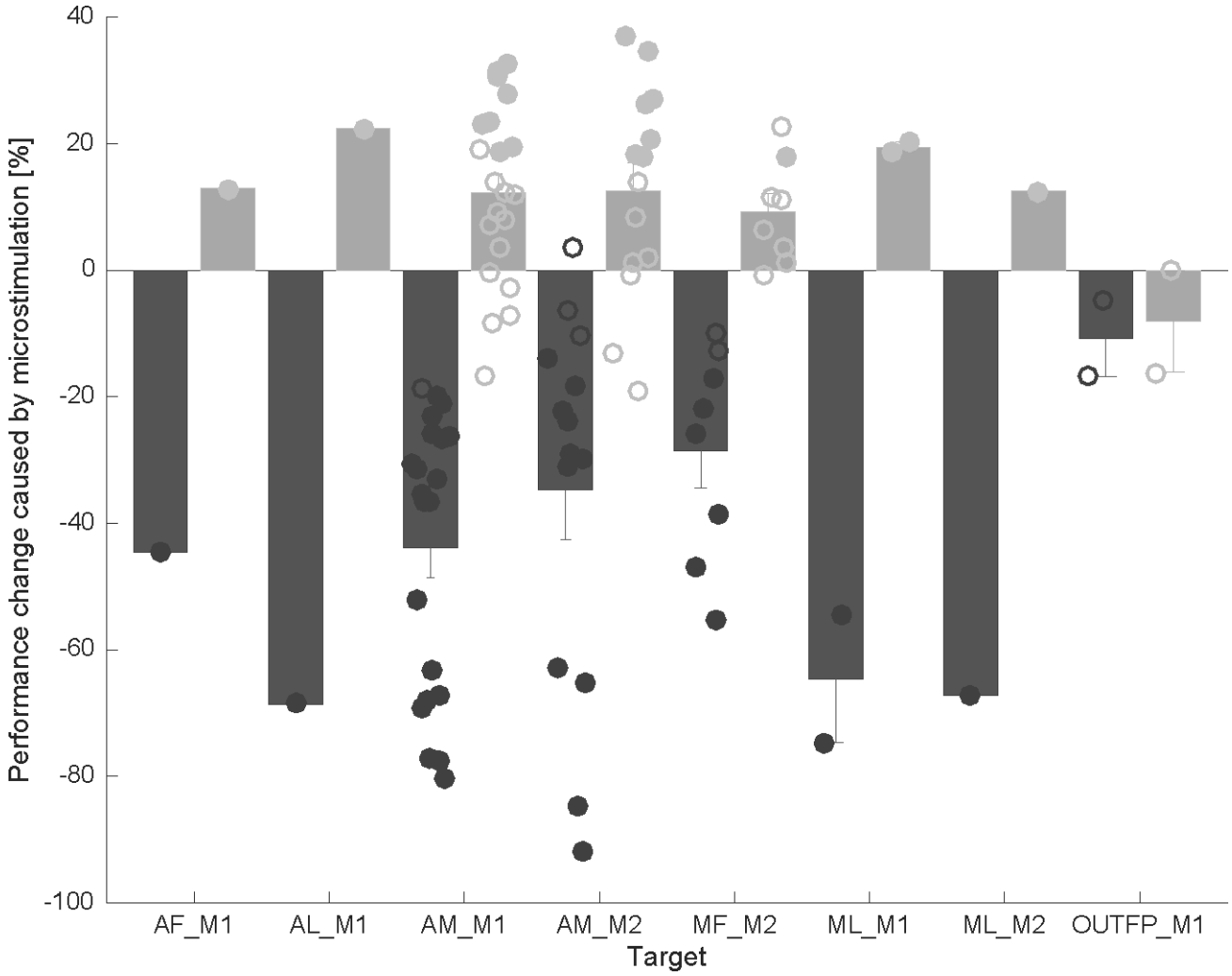
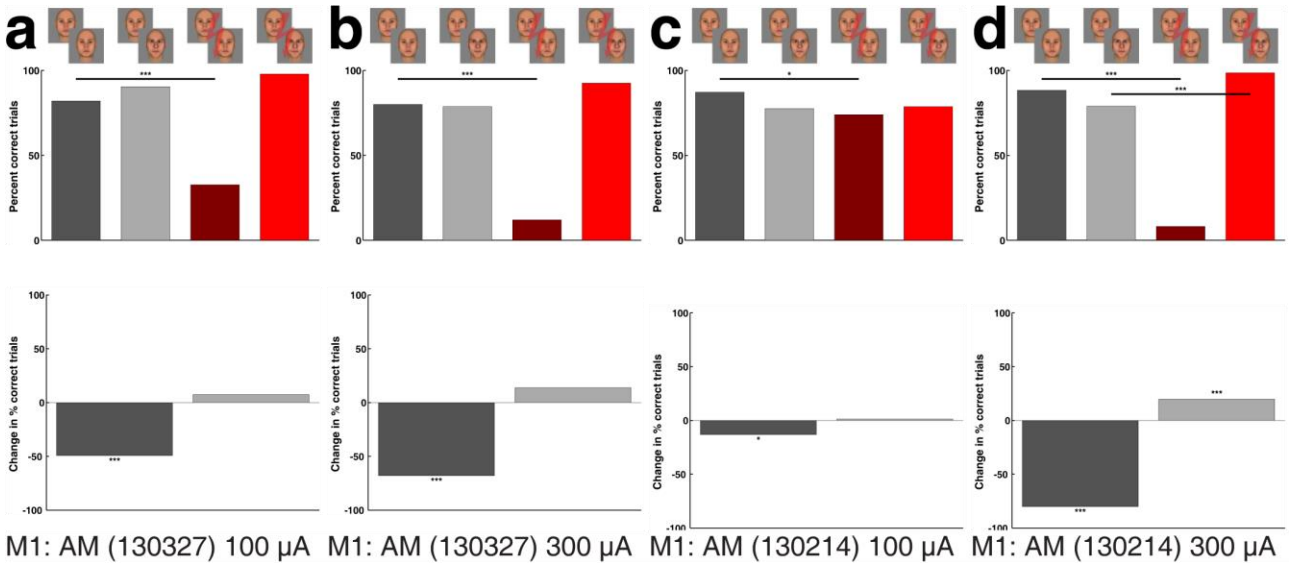
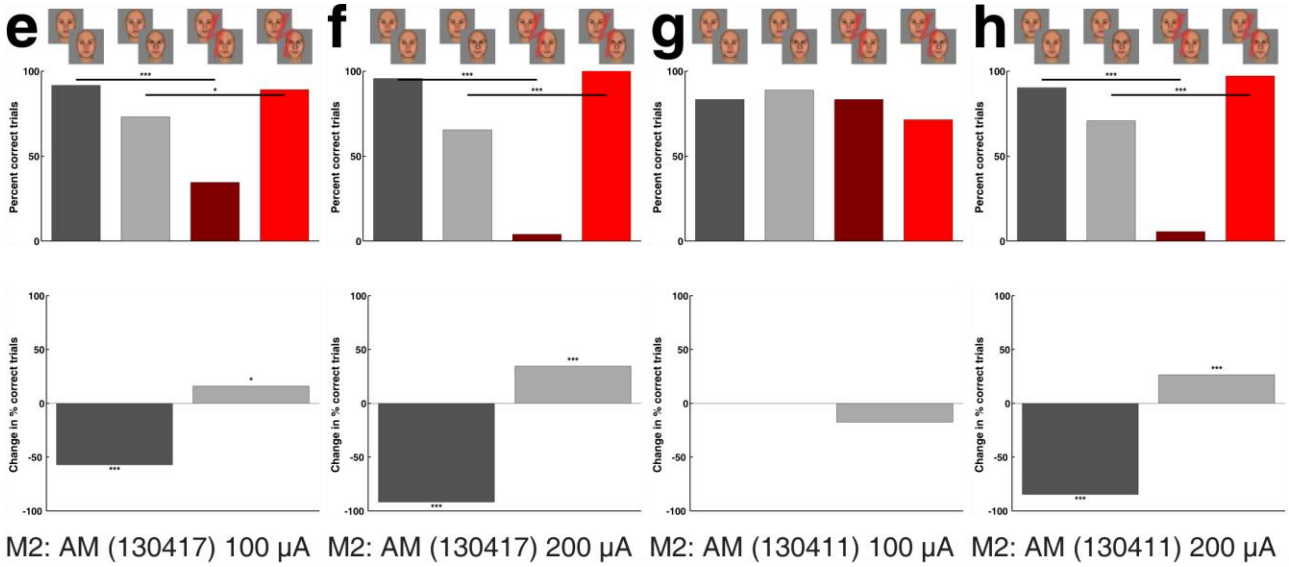


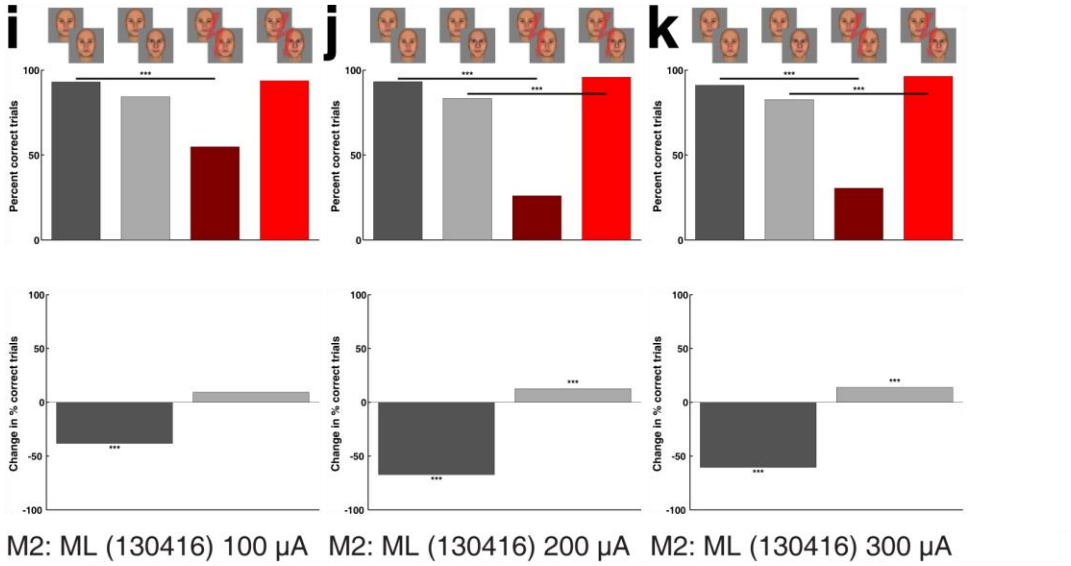

**Supplementary Figure 1**

Mean change in performance caused by microstimulation of each face patch.

Dark gray bars for same identity trials, light gray bars for different identity trials, error bars show the standard error of the mean. The results of individual sessions are shown as circles, filled circles show session in which the effect size was significant with $p <= 0.01$. As shown in Figure 3, effect size per session correlates with the face selectivity of each stimulation site, explaining the sessions with smaller effect sizes.


a
b
c
d
Percent correct trials
Change in % correct trials
M1: AM (130327) 100 µA
M1: AM (130327) 300 µA
M1: AM (130214) 100 µA
M1: AM (130214) 300 µA

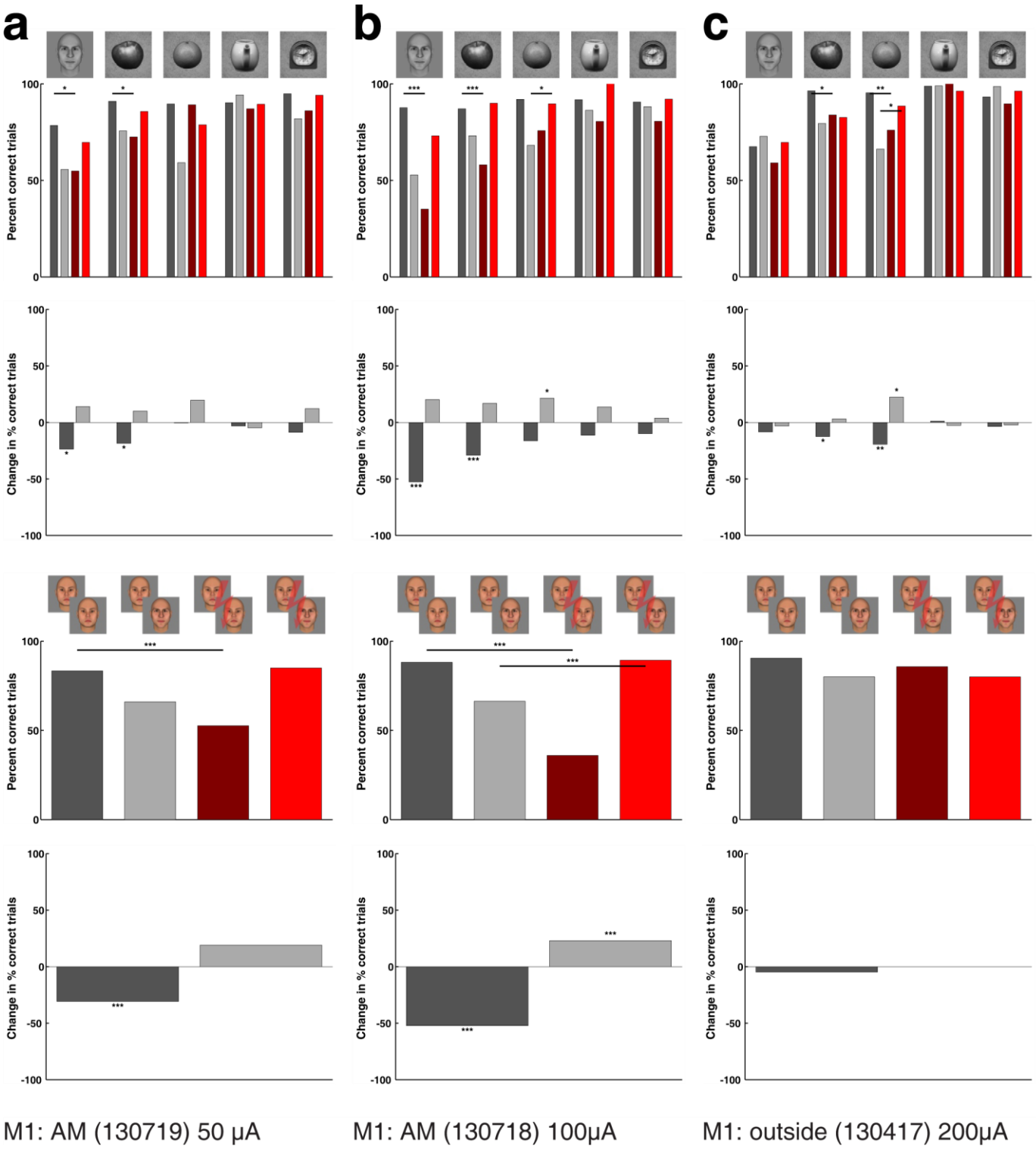

e
f
g
h
Percent correct trials
Change in % correct trials
M2: AM (130417) 100 µA
M2: AM (130417) 200 µA
M2: AM (130411) 100 µA
M2: AM (130411) 200 µA


i
j
k
Percent correct trials
Change in % correct trials
M2: ML (130416) 100 µA
M2: ML (130416) 200 µA
M2: ML (130416) 300 µA

**Supplementary Figure 2**

The dependence of effect magnitude for faces on stimulation current strength.

(**a, b**) Behavioral performance on same- and different-identity trials, with and without microstimulation, for stimulation strength magnitude of 100 μA (a) and 300 μA (b), with stimulation performed in the same session (AM, M1). (**c, d**) Another session, comparing effect on behavior of face patch stimulation at 100 μA and 300 μA (AM, M1). (**e, f**) Effect of face patch stimulation at 100 μA and 200 μA during the same session (AM, M2). (**g, h**) Effect of face patch stimulation at 100 μA and 200 μA during the same session (AM, M2). (**i, j, k**) Effect of face patch stimulation at 100 μA, 200 μA, and 300 μA during the same session (ML, M2). Gray bars denote trials without, red bars trials with electrical micro-stimulation; Darker bars show the performance for same identity trials, lighter bars for different identity trials. *: $P < 0.05$; **: $P < 0.01$; ***: $P < 0.005$; Fisher's exact test (see **Supplementary Table 3** for exact *P*-values). The lower plot in each panel shows the change in percentage points caused by electrical stimulation for same identity trials in dark gray and for the different identity trials in light gray.

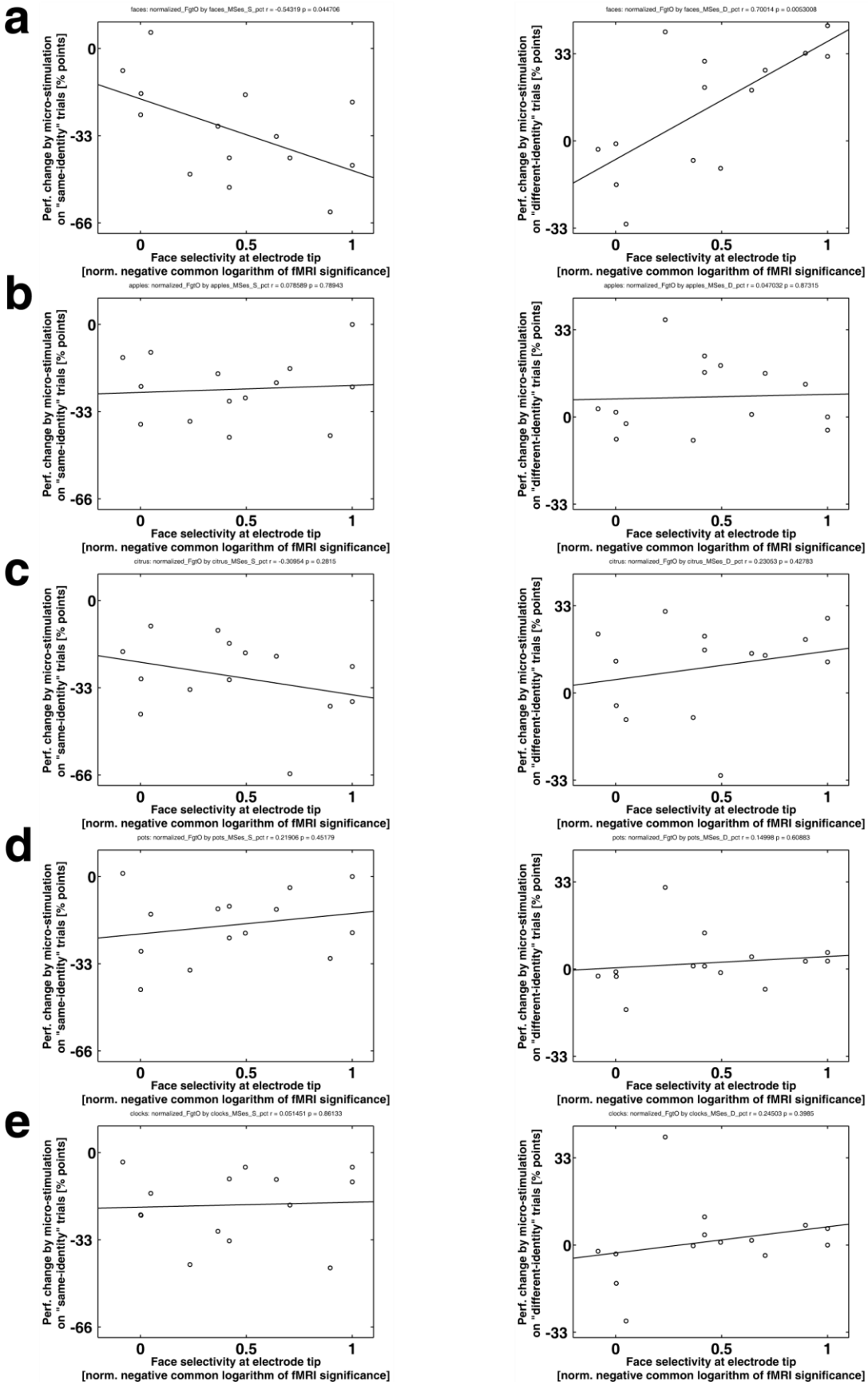



**Supplementary Figure 3**

The dependence of effect magnitude for round objects on stimulation current strength and electrode position, for subject M1 for three different sessions.

(**a**) Low stimulation current (50 µA) inside face patch AM. (**b**) Intermediate stimulation current (100 µA) inside face patch AM. (**c**) Large stimulation current (200 µA) outside the face patches. Top row: Behavioral performance on same and different trials, with and without

microstimulation, for stimulation in face patch AM of monkey M1, for faces, apples, citrus fruits, teapots, and clocks. 2nd row: Size of stimulation effect in percentage points for the same five categories. 3rd row: Behavioral performance on same and different identity trials of the face identification task of the same session. 4th row: Size of stimulation effect for the face identification task. Conventions as in Suppl. Fig. 2. *: P < 0.05; **: P < 0.01; ***: P < 0.005; Fisher's exact test (see **Supplementary Table 3** for exact *P*-values).

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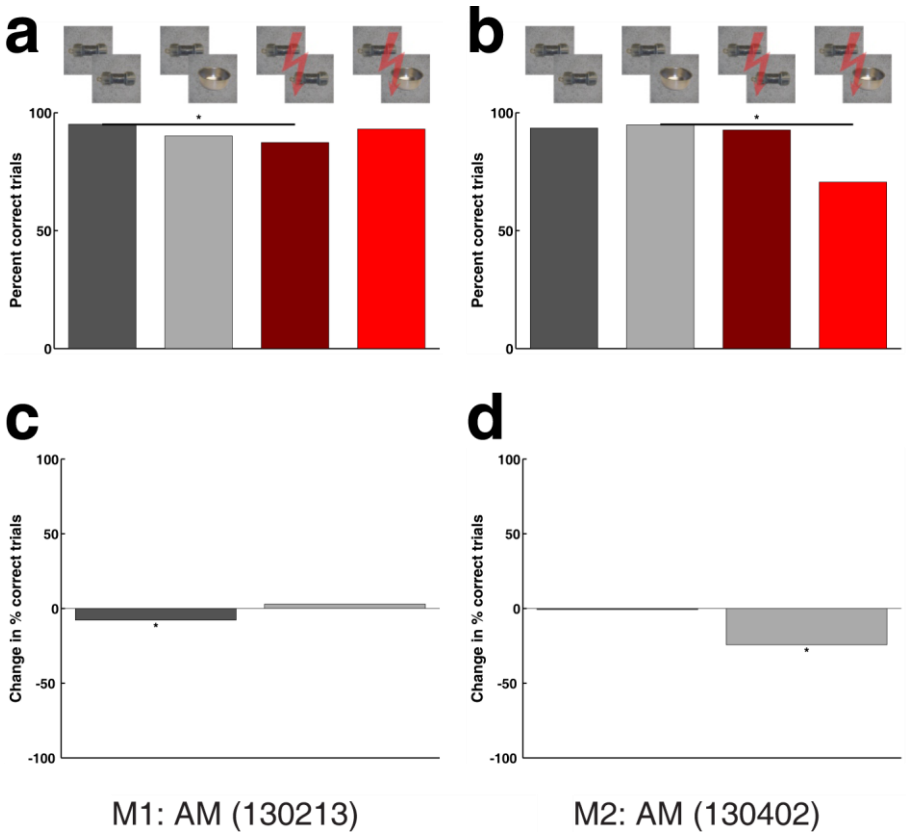
**Supplementary Figure 4**

The dependence of effect magnitude on proximity of the stimulation site to the center of the face patch, for the five different object categories from Experiment 3.

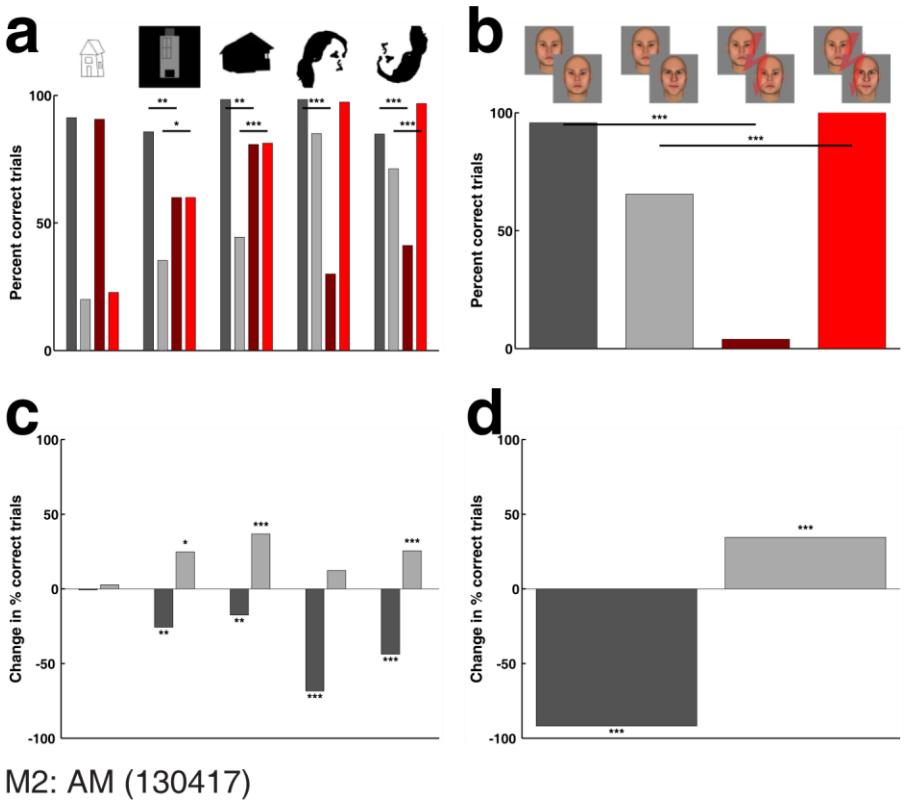
Same conventions as in Figure 3a. Pooled data for 14 sessions (M1: 9, M2: 5) showing how the magnitude of electrical microstimulation effect on same (left column) and different identity trials (right column) correlates with the face selectivity of the target location as measured by fMRI. Out of the five object categories (faces (**a**), apples (**b**), citrus fruit (**c**), pots (**d**) and clocks (**e**)), only for faces was there a significant correlation (same identity trials: p: 0.044706, correlation coefficient r = -0.54319, $r^2$ = 0.2951; different identity trials: p: 0.0053008, correlation coefficient r = 0.70014, $r^2$ = 0.4902).




**Supplementary Figure 5**

Experiment 2: effect of stimulation inside face patch AM on the perception of nonround objects.

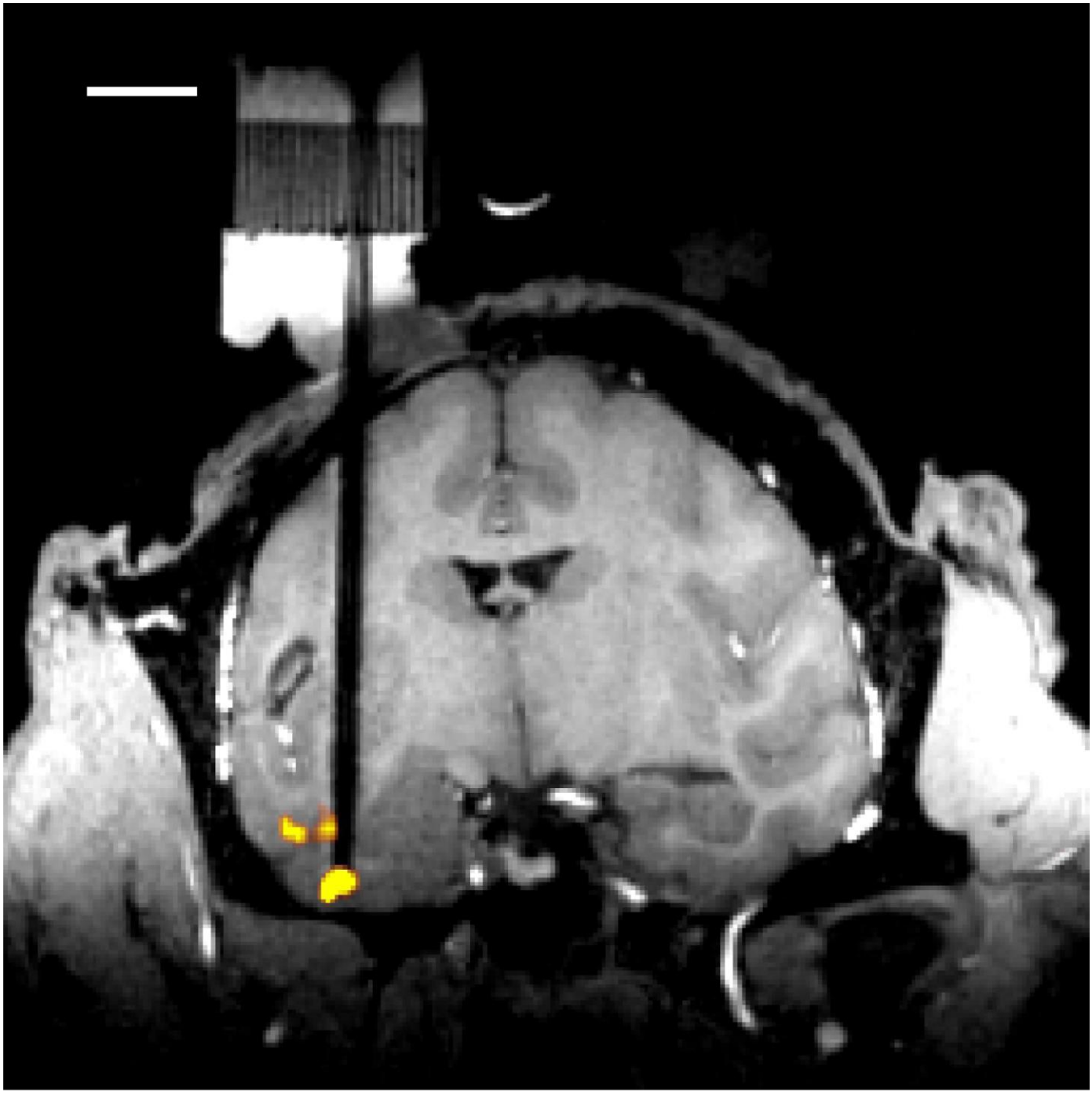
Conventions as in Fig. 2. (**a**) Effect of AM stimulation on non-round object perception in monkey M1. Performance was significantly worse on microstimulation "same" trials (reduction by 7.77 percentage points). (**c**) Performance change in percentage points caused by electrical microstimulation for same- (dark gray bar) and different-identity trials (light gray bar) (**b**) Same as (a) and (**d**) same as (c), for stimulation in monkey M2. Stimulation current was 300 μA. *: $P < 0.05$; Fisher's exact test (see **Supplementary Table 3** for exact *P*-values).




**Supplementary Figure 6**

Experiment 4b: effect of stimulation inside face patch AM on perception of non-face objects II in M2.

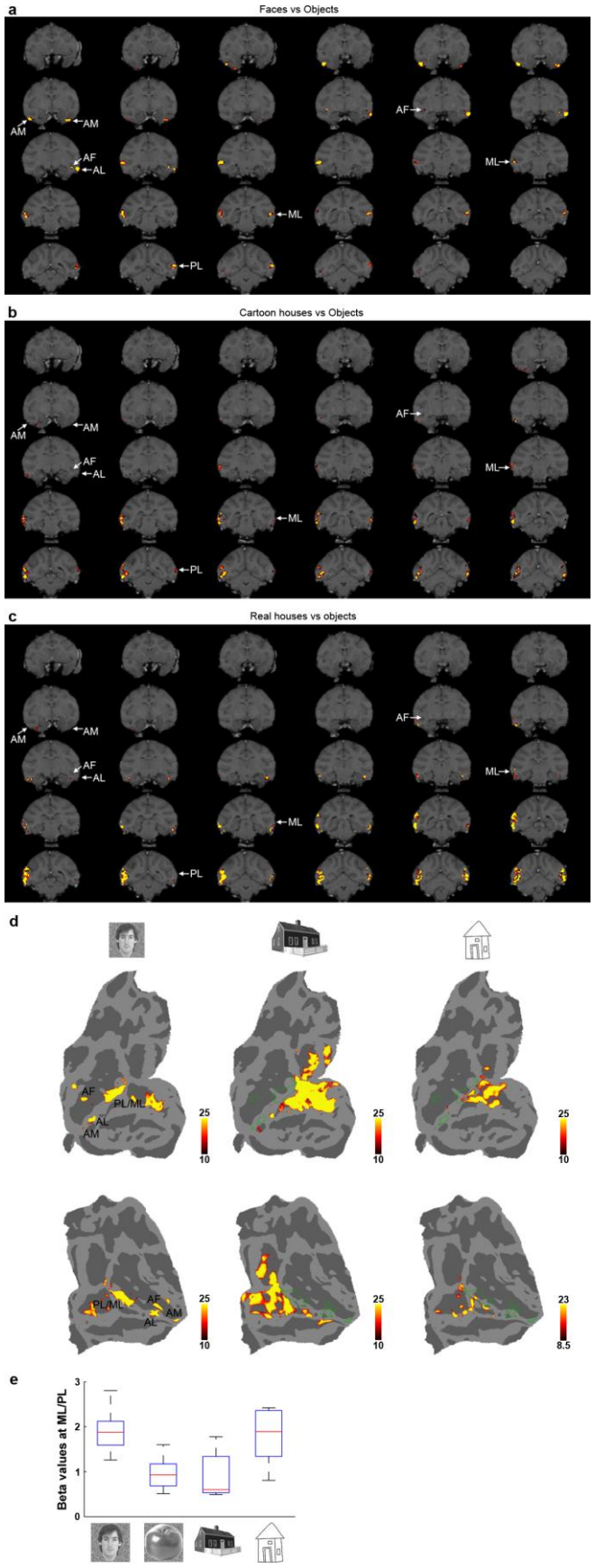
(**a**) Effect of face patch stimulation on perception of house line drawings, house cartoons, house silhouettes, Mooney faces, and upside down Mooney faces. (**b**) Effect obtained in same experimental session, for face stimuli of Experiment 1. (**c**) Performance change in percentage points caused by electrical microstimulation for same- (dark gray bar) and different-identity trials (light gray bar) for each of the five categories of non-face objects II, and (**d**) for the faces of Experiment 1. Stimulation current was 200 μA. Conventions as in Fig. 4. *: P < 0.05; **: P < 0.01; ***: P < 0.005; Fisher's exact test (see **Supplementary Table 3** for exact *P*-values).




**Supplementary Figure 7**

Electrode position for M1 showing that, for the data presented in **Figure 7**, the electrode tip was located inside face patch AM.

Scale bar (top left) = 1 cm.


a
Faces vs Objects
AM
AM
AF
AL
ML
PL
AF
ML
b
Cartoon houses vs Objects
AM
AM
AF
AL
ML
PL
AF
ML
c
Real houses vs objects
AM
AM
AF
AL
ML
PL
AF
ML
d
AF
PL/ML
AL
AM
25
10
25
10
25
10
PL/ML
AF
AM
AL
25
10
25
10
23
8.5
e
Beta values at ML/PL
3
2
1
0

**Supplementary Figure 8**

Activation to faces, cartoon houses, real houses and real objects.

(**a**) Coronal slices showing fMRI activation to the contrast faces > objects. Face patches are indicated by arrows. (**b, c**) Slices from the same animal as (a), showing activation to the contrast cartoon houses > objects (b), and real houses > objects (c). (**d**) Flat maps of the left and right hemisphere visual cortex, showing the same data as (a-c). Face patches are indicated by green outlines. Notice overlap between face patches ML and PL and cartoon house activation (middle two panels), which is absent for real house activation (right two panels). Face patches indicated by green outlines in middle and right panels. (**e**) Beta values for faces, cartoon houses, real houses, and real objects, from PL/ML, showing strong activation to faces and to cartoon houses. Box-and-whisker plot indicates the median value (red line), the 25–75$^{th}$ percentiles (box) and +/- 2.7 sigma (whiskers).

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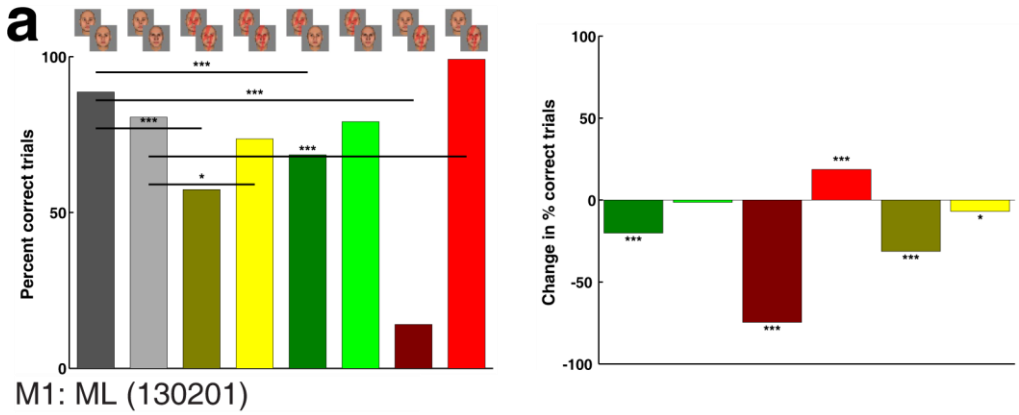
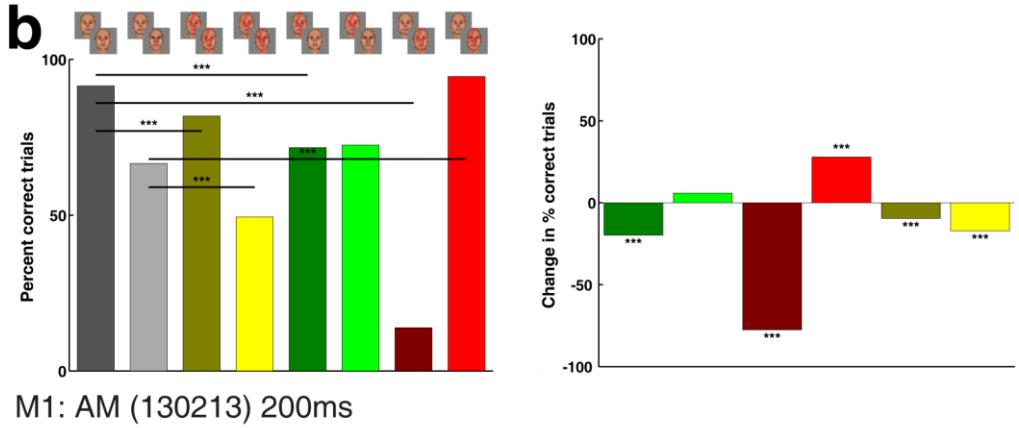
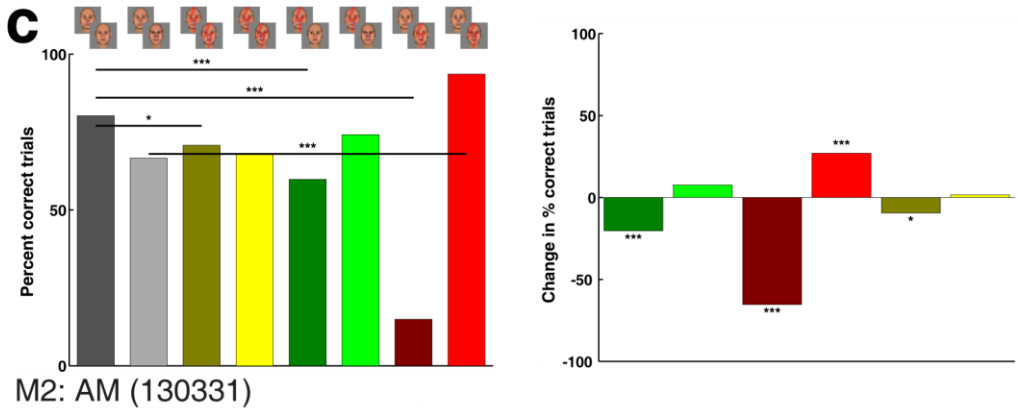
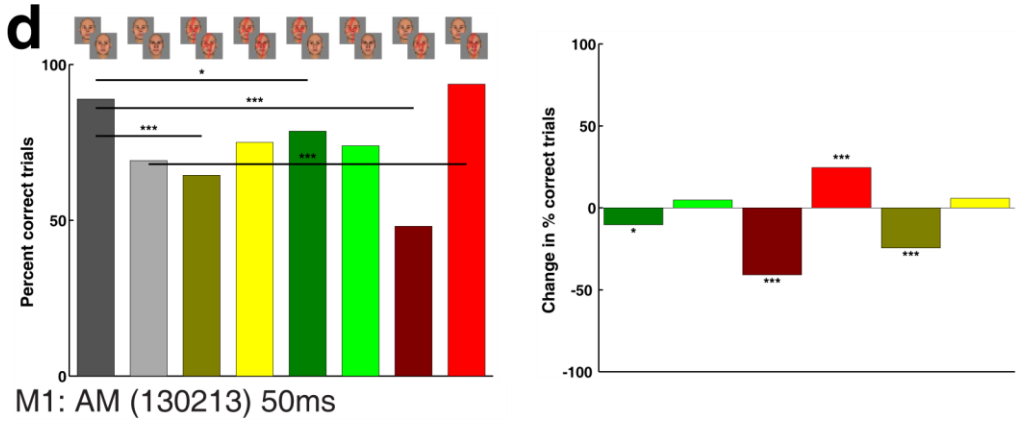


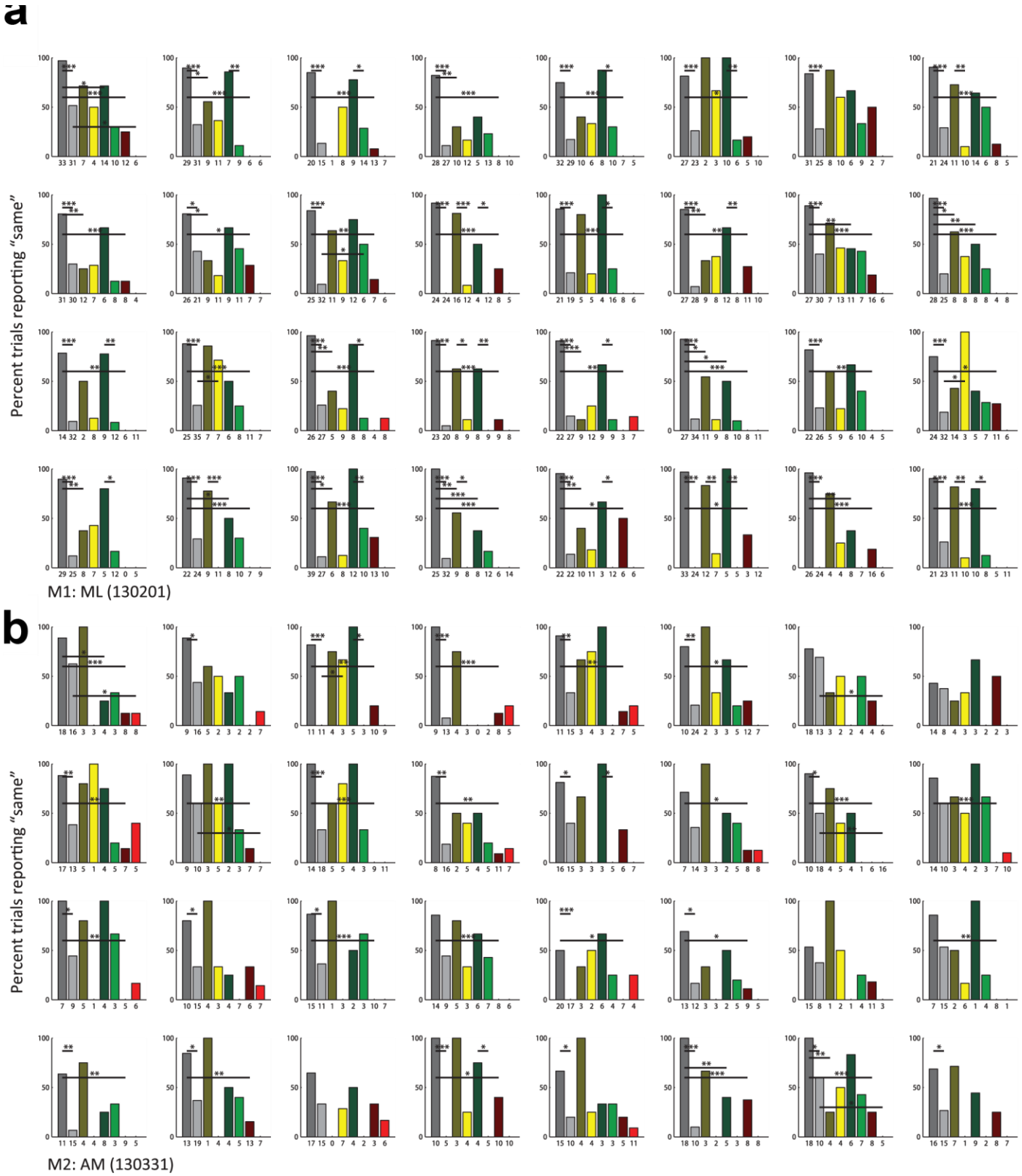




Nature Neuroscience: doi:10.1038/nn.4527

**Supplementary Figure 9**

Experiment 5: dependence of effect magnitude on stimulation timing.

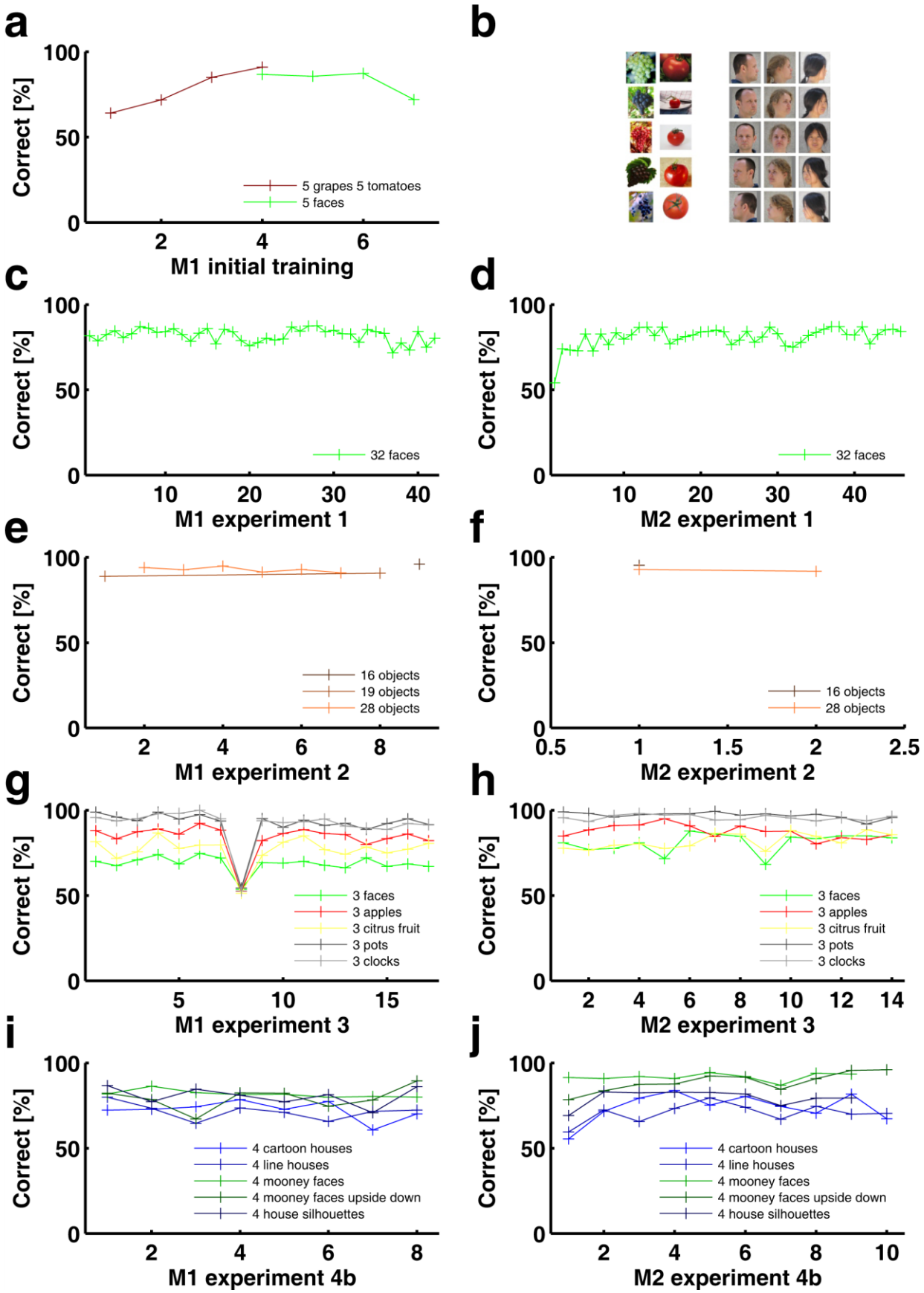
Behavioral performance for same- and different-identity trials, across four different stimulation conditions: no stimulation (gray bars), stimulation during cue 1 and cue 2 (yellow bars), stimulation during cue 1 (green bars), stimulation during cue 2 (red bars). Plots on the right show the change in percentage points caused by electrical stimulation (electrical stimulation during cue1: green; during cue2: red; during both cues: yellow). Darker bars denote same-identity trials, lighter bars different-identity trials. *: $P < 0.05$; **: $P < 0.01$; ***: $P < 0.005$; Fisher's exact test (see **Supplementary Table 3** for exact *P*-values). (**a**): ML, M1, (**b**): AM M1, (**c**): AM M2. (**d**): AM M1: Stimulation experiment in M1, with stimulation trains of 50 ms duration (images were presented for 200 ms each), instead of 200 ms (b). All trains were delayed by 75 ms relative to visual stimulation to account for the typical response latency of anterior temporal cortex.




**Supplementary Figure 10**

Analysis of data in **Supplementary Figure 9**, separating data for each of 32 different cue 2 identities.

(**a**, **b**) Analysis of data in panels (a), (b) of Supplementary Figure 9, respectively. Numbers below each bar indicate number of contributing trials, *: P < 0.05; **: P < 0.01; ***: P < 0.005; Fisher's exact test (see **Supplementary Table 5** for exact *P*-values). A 3-way ANOVA examining main effects and interactions of identity, trial type (same/different) and microstimulation (yes/no) showed significant main effects for trial (same/different) and stimulation condition, but not for identity, and a significant interaction between trial and stimulation. The results do not support the idea that effect of stimulation depended on the specific identity of the face: this would show up as a two-way interaction between stimulation and identity or three-way interaction between stimulation, trial type, and identity. M1 (a), trial type $F(1, 92) = 401.58$, $p < 0.0001$; stimulation $F(3, 92) = 110.74$, $p < 0.0001$; identity $F(31, 92) = 1.51$, $p = 0.0666$; trial*stimulation $F(3, 92) = 39.75$, $p < 0.0001$; trial*identity $F(31, 92) = 1.51$, $p = 0.0665$, stimulation*identity $F(93, 92) = 0.94$, $p = 0.6137$; M2 (b), trial type $F(1, 92) = 150.51$, $p < 0.0001$; stimulation $F(3, 92) = 57.88$, $p < 0.0001$; identity $F(31, 92) = 1.15$, $p = 0.2937$; trial*stimulation $F(3, 92) = 10.22$, $p < 0.0001$; trial*identity $F(31, 92) = 1.16$, $p = 0.2846$, stimulation*identity $F(93, 92) = 0.83$, $p = 0.8079$.


a
Correct [%]
100
50
0
2
4
6
5 grapes 5 tomatoes
5 faces
M1 initial training
b
c
Correct [%]
32 faces
10
20
30
40
M1 experiment 1
d
Correct [%]
32 faces
M2 experiment 1
e
Correct [%]
16 objects
19 objects
28 objects
2
4
6
8
M1 experiment 2
f
Correct [%]
16 objects
28 objects
0.5
1
1.5
2
2.5
M2 experiment 2
g
Correct [%]
3 faces
3 apples
3 citrus fruit
3 pots
3 clocks
5
10
15
M1 experiment 3
h
Correct [%]
3 faces
3 apples
3 citrus fruit
3 pots
3 clocks
2
4
6
8
10
12
14
M2 experiment 3
i
Correct [%]
4 cartoon houses
4 line houses
4 mooney faces
4 mooney faces upside down
4 house silhouettes
M1 experiment 4b
j
Correct [%]
4 cartoon houses
4 line houses
4 mooney faces
4 mooney faces upside down
4 house silhouettes
M2 experiment 4b

**Supplementary Figure 11**

Behavioral performance from training sessions and from experimental sessions from nonmicrostimulated trials.

This figure shows the task performance over the course of multiple sessions, always starting with the first session a stimulus set was introduced. Performance was averaged over same and different identity trials. (**a**) M1: The red line shows the initial task that consisted of performing same/different discrimination between five images of grape clusters and five images of single tomatoes; for the same condition we always presented the exact same image, for different we always selected one image from the five exemplars of the other category. The green line shows the initial performance on the initial face identity discrimination task. In this task we presented color photographs of 5 persons at 5 different views each, for the same condition we only selected the $2^{nd}$ cue image from the 4 images of each identity not used as $1^{st}$ cue, for the different condition we randomly selected one of the 20 images belonging to the remaining identities. Note how the performance for grapes and tomatoes ramps up over 4 sessions and how well the animal transferred to the face identification task (the animal had discriminated different face stimuli in past experiments). (**b**) Example stimuli. Left: all grape and tomato images used in initial training. Right: three exemplary identities at five views. (**c**) M1 and (**d**) M2 performance in >40 sessions with the 32 identities at 6 different facial expressions task (see Experiment 1). Note with M2 there was an initial ramping up from near chance performance, but both animals generalized quickly from the initially trained face set to the new set. (**e & f**) Performance in the different versions of the object identification task (as described in Experiment 2); both M1 and M2 immediately generalized to the different object sets. Note that we only added more stimuli, so the 16 objects set was a subset of both the 19 and 28 objects sets. (**g & h**) Performance for Experiment 3: both animals immediately generalized to the five new categories. Note that on the $8^{th}$ session, M1 changed his strategy to guessing only to return to "normal" performance on the next session. (**i & j**) Performance on the abstract face and house stimuli from Experiment 4b; M1 immediately generalized to the new stimuli, while M2's performance improved over the first few sessions before stabilizing.

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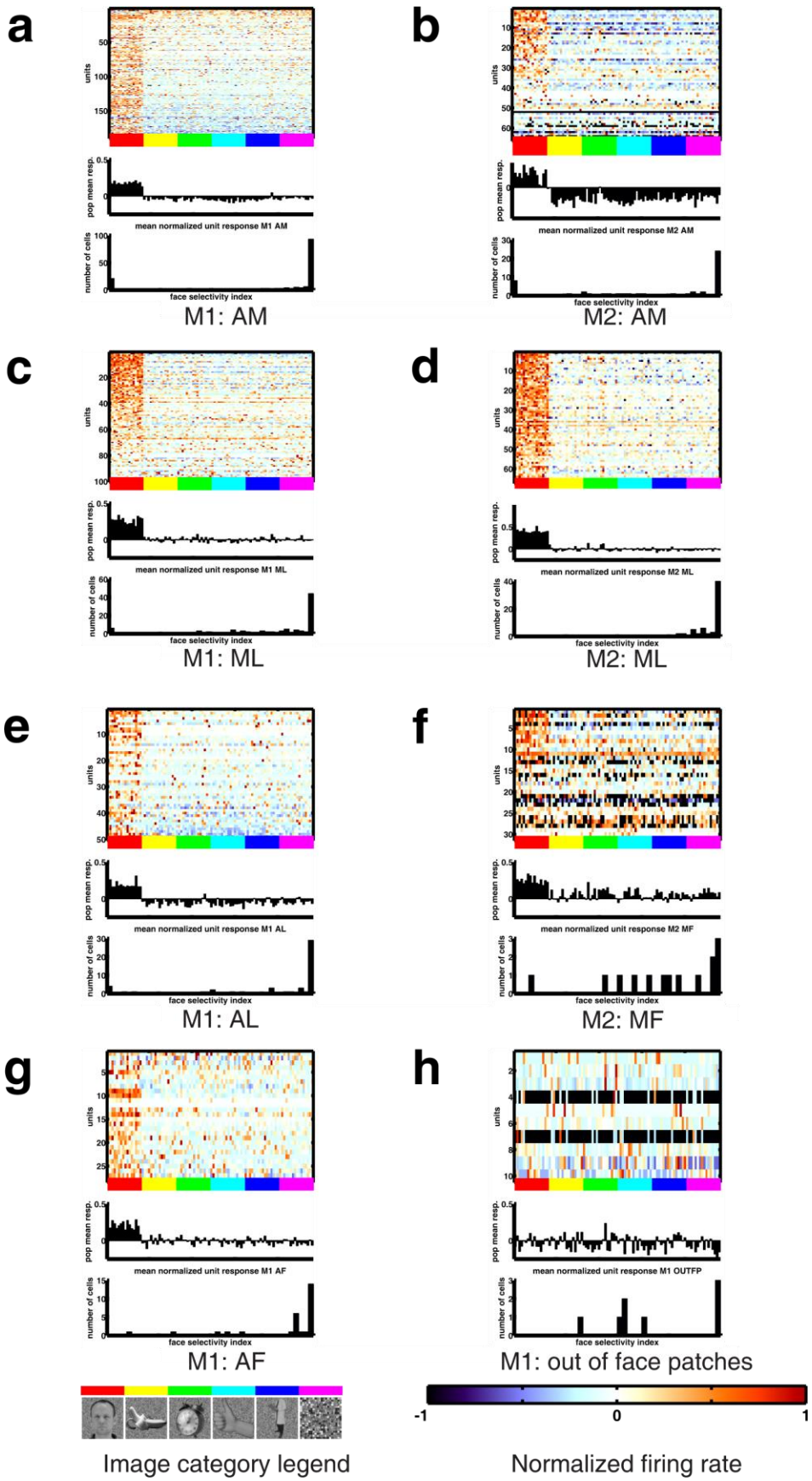


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**Supplementary Figure 12**

Neuronal response selectivity at the different stimulation sites, across animals.

The upper part of each panel shows the normalized mean response over 200 ms for each unit to each of the 96 consensus images, while the middle part shows the population mean response. Note that most units were recorded for the minimal time to see whether there was a difference between responses to face and non-face categories, so often, images were not repeated enough times to allow the normalization to work; such occurrences are colored black in the upper panels and ignored for the averaging shown in the middle panels. The lower part of each panel shows the distribution of the face selectivity indices for all units per patch and animal, distance from the midpoint at zero correlates with face selectivity. The category of each image is color-coded by the rainbow bar. The order of the presented population data mainly follows Fig. 2 to facilitate direct comparison: (**a**) AM of monkey M1 (**b**) AM of M2, (**c**) ML of M1, (**d**) ML of M2, (**e**) AL of M1, (**f**) MF of M2, (**g**) AF of M1 (**h**) control site outside of the face patches in M1.

**Supplementary Table 1**. Selected statistics for the reported sessions; column two also indicates the figure(s) this session is shown in. Same identity trial aggregates are indicated by the S string, different identity trial aggregates by the D string. Microstimulation during cue 2 is indicated by the MSC02 string, d: d', c: criterion c, effect size: percent correct difference between trials with and without microstimulation, P denotes the significance of the effect size (Fisher's exact test), a value of 0 denotes P < 0.0000000005. This table contains all sessions for Experiments 1 and 2.

| Session | Figure | Current µA | Notes | Subject | Target | #Trials_noMS | #Trials_MS | d(S.D) | d(S_MSC02.D_MSC02) | c(S.D) | c(S_MSC02.D_MSC02) | effect-size_[%](S_MSC02-S) | effect-size_[%](D_MSC02-D) | P(S_MSC02-S) | P(D_MSC02-D) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1301301432 | | 300 | | 1 | ML | 1086 | 532 | 1.686538965 | 0.858956888 | -0.322729316 | 0.863789605 | -54.61612844 | 20.33843864 | 0 | 0 |
| 1302011544 | F2c, S9a | 300 | | 1 | ML | 1840 | 528 | 2.070566448 | 1.321942213 | -0.174125069 | 1.739065271 | -74.62511202 | 18.63787504 | 0 | 0 |
| 1302131221 | F2a, F3a, F4d, S9b | 300 | 200ms MS dur | 1 | AM | 1513 | 512 | 1.801223111 | 0.513693857 | -0.471112831 | 1.340584859 | -77.56848668 | 27.86954151 | 0 | 0 |
| 1302131221 | S9d | 300 | 50ms MS dur | 1 | AM | 633 | 205 | 1.722945485 | 1.480569841 | -0.361200103 | 0.788507994 | -40.85041256 | 24.52836637 | 0 | 0.000000284 |
| 1302141229 | S2d | 300 | | 1 | AM | 917 | 298 | 1.998003529 | 0.803505246 | -0.194793308 | 1.795925832 | -80.20882772 | 19.66522839 | 0 | 0 |
| 1302141229 | S2c | 100 | | 1 | AM | 320 | 110 | 1.892470749 | 1.436327189 | -0.188681244 | 0.077496705 | -13.2664437 | 1.124422026 | 0.038950037 | 1 |
| 1302151316 | F2g | 300 | | 1 | AF | 1366 | 543 | 2.15596015 | 1.933895824 | -0.022354344 | 1.172632834 | -44.58882611 | 12.93752883 | 0 | 0 |
| 1302161303 | F2e | 300 | | 1 | AL | 575 | 184 | 1.539885097 | 0.361516264 | -0.302243749 | 1.125427723 | -68.57680251 | 22.42553192 | 0 | 0.000010172 |
| 1303271654 | F3a, F5bd, S2b | 300 | | 1 | AM | 127 | 66 | 1.637281533 | 0.264544679 | -0.022980467 | 1.307259132 | -68 | 13.81147541 | 0.000000005 | 0.093591932 |
| 1303271654 | S2a | 100 | | 1 | AM | 301 | 98 | 2.224427902 | 1.570660717 | 0.194892765 | 1.233755842 | -49.35897436 | 7.384910486 | 0 | 0.195888465 |
| 1303301907 | | 300 | | 1 | AM | 156 | 71 | 1.761764574 | Inf | -0.375561198 | Inf | -77.05223881 | 30.66666667 | 0 | 0.000156806 |
| 1303311208 | F2b, F3a, S9c | 300 | | 2 | AM | 864 | 480 | 1.277114884 | 0.480854723 | -0.209986223 | 1.282192326 | -65.31720366 | 27.01907064 | 0 | 0 |
| 1304011724 | F3a | 300 | | 1 | AM | 480 | 307 | 1.440293741 | 1.336884534 | -0.218667446 | 0.493740359 | -25.67438908 | 18.54362325 | 0.000000133 | 0.000017209 |
| 1304021204 | F3a, F4f | 300 | | 2 | AM | 246 | 122 | 1.301361205 | 0.534792829 | -0.641113173 | 0.871981761 | -62.90584416 | 36.89104788 | 0 | 0.000001194 |
| 1304031338 | F7bd | 300 | | 1 | AM | 173 | 80 | 1.861416357 | Inf | -0.20420844 | Inf | -68.997669 | 23.37662338 | 0 | 0.001446435 |
| 1304031338 | F3a | 300 | | 1 | AM | 176 | 94 | 1.270430179 | Inf | -0.180550624 | Inf | -67.36353078 | 32.46753247 | 0 | 0.000002921 |
| 1304051608 | F3a | 300 | | 1 | AM | 177 | 209 | 1.988976802 | 1.021188969 | -0.696133228 | 0.966930807 | -63.04713805 | 31.29486075 | 0 | 0.000001402 |
| 1304071529 | F3a | 300 | | 1 | AM | 647 | 146 | 1.802542039 | 1.025407537 | -0.274400841 | 0.385211415 | -32.94123486 | 8.075678367 | 0.000000005 | 0.208795278 |
| 1304101638 | F3a | 300 | | 1 | AM | 54 | 20 | 2.443936389 | Inf | -0.422885432 | Inf | -75 | 21.21212121 | 0.000063605 | 0.17247686 |
| 1304111326 | F3a, S2h | 200 | | 2 | AM | 301 | 133 | 1.840544701 | 0.321287007 | -0.373325991 | 1.753862322 | -84.65423465 | 26.44300144 | 0 | 0.000000841 |
| 1304111326 | S2g | 100 | | 2 | AM | 21 | 13 | 2.188061915 | 1.533370388 | 0.126609391 | -0.200736372 | 0 | -17.46031746 | 1 | 0.55 |
| 1304141610 | | 200 | | 1 | OUTFP | 172 | 83 | 1.934655682 | 0.869489931 | 0.077080954 | 0.062455605 | -16.8172043 | -16.13756614 | 0.079943678 | 0.056937392 |
| 1304161430 | S2k | 300 | | 2 | ML | 381 | 182 | 2.285720434 | 1.28797043 | -0.2040459 | 1.153307535 | -60.57316065 | 13.77684652 | 0 | 0.001435869 |
| 1304161430 | F2d, S2j | 200 | | 2 | ML | 376 | 199 | 2.459825744 | 1.0931616 | -0.262491306 | 1.189926205 | -67.22033898 | 12.54295533 | 0 | 0.002294058 |
| 1304161430 | S2i | 100 | | 2 | ML | 170 | 65 | 2.491959575 | 1.655707927 | -0.237560072 | 0.706266581 | -38.2647386 | 9.412650602 | 0.000007134 | 0.228765611 |
| 1304171554 | S2f, S6bd | 200 | | 2 | AM | 231 | 120 | 2.11828775 | Inf | -0.66064907 | Inf | -91.8049271 | 34.51327434 | 0 | 0.000000001 |
| 1304171554 | S2e | 100 | | 2 | AM | 201 | 111 | 1.999388284 | 0.833755544 | -0.383299985 | 0.814499434 | -57.12121212 | 15.97262952 | 0 | 0.022418098 |
| 1304172302 | F4a, S3c | 200 | | 1 | OUTFP | 147 | 51 | 2.15079295 | 1.909191757 | -0.233775242 | -0.112974645 | -4.761904762 | 0 | 0.6843922 | 1 |
| 1305141946 | | 300 | | 1 | AM | 53 | 99 | 1.976028392 | 1.388292366 | 0.079556328 | 0.358108043 | -18.66028708 | -0.348432056 | 0.176379152 | 1 |
| 1305171419 | | 300 | | 1 | AM | 140 | 57 | 2.150252837 | 0.577931135 | 0.316833861 | 0.385524183 | -31.43236074 | -16.80327869 | 0.005995795 | 0.066951616 |
| 1305261621 | | 300 | | 1 | AM | 259 | 176 | 1.910512981 | 1.23482753 | -0.096081361 | 0.6512936 | -36.69617894 | 9.284922395 | 0.000000085 | 0.083771469 |
| 1305271525 | | 300 | | 1 | AM | 442 | 332 | 1.888896931 | 0.561654617 | 0.004086575 | 0.382622908 | -36.70245588 | -8.209255533 | 0 | 0.094666114 |
| 1305301548 | | 300 | | 1 | AM | 353 | 257 | 1.55186714 | 0.833711566 | -0.10144382 | 0.168128093 | -21.16448692 | -2.927927928 | 0.000253277 | 0.668963621 |
| 1306011734 | | 300 | | 2 | AM | 303 | 194 | 1.832179976 | 1.159005192 | -0.51676692 | 0.236647291 | -28.99042915 | 13.7620379 | 0.00000006 | 0.017695631 |
| 1306061659 | | 200 | | 2 | AM | 356 | 243 | 1.940681658 | 1.541998093 | -0.340403567 | -0.076540929 | -10.33750404 | 2.06703371 | 0.015675491 | 0.785356392 |
| 1307111430 | | 300 | | 1 | AM | 797 | 522 | 1.954949401 | 0.856918057 | -0.155148184 | 0.166719505 | -26.80748065 | -7.041652441 | 0 | 0.039021503 |
| 1307121543 | | 300 | | 1 | AM | 217 | 146 | 1.242770144 | 0.929423068 | -0.417054573 | 0.07188072 | -19.76895119 | 12.32729712 | 0.003377239 | 0.112495225 |
| 1307181509 | F3a, F4hj, S3b | 100 | | 1 | AM | 415 | 274 | 1.605289883 | 0.887536951 | -0.381253665 | 0.802227269 | -52.1773399 | 23.03517152 | 0 | 0.000000646 |
| 1307190955 | S3a | 50 | | 1 | AM | 126 | 81 | 1.379884696 | 1.102445202 | -0.277479218 | 0.485210789 | -30.70175439 | 19 | 0.001294164 | 0.052377865 |
| 1307211710 | F3a | 300 | | 1 | AM | 515 | 310 | 2.146538772 | 1.30231645 | -0.418159013 | 0.121034989 | -23.00887167 | 3.619834711 | 0.000000001 | 0.467498474 |
| 1307251707 | F3a | 200 | | 2 | AM | 400 | 287 | 1.76275855 | 1.090637891 | -0.752303003 | 0.160983617 | -29.92021728 | 20.86486487 | 0 | 0.000088359 |
| 1307261725 | | 50 | | 2 | AM | 237 | 145 | 1.748759193 | 1.742225737 | -0.315142619 | -0.047670381 | -6.198736049 | 8.287179487 | 0.271094102 | 0.247145322 |
| 1307271417 | | 50 | | 2 | AM | 229 | 150 | 2.356376789 | 2.454605527 | -0.410416897 | 0.510805263 | -18.07673389 | 18.0215585 | 0.000596465 | 0.000440171 |
| 1307291233 | F3a, F5fh | 300 | | 2 | AM | 471 | 283 | 1.90948344 | 1.275258778 | -0.583592397 | 0.310067899 | -30.96381506 | 18.36213669 | 0 | 0.000180501 |
| 1307291233 | F3a | 300 | | 2 | AM | 250 | 172 | 2.184634337 | 1.144492757 | -0.382168487 | -0.234603312 | -13.97011046 | -12.90101218 | 0.004882798 | 0.048406398 |
| 1307301727 | F3a | 300 | | 2 | AM | 763 | 510 | 2.38120399 | 1.354773952 | -0.396312687 | 0.094545468 | -22.37340154 | -0.656370656 | 0 | 0.844639036 |
| 1308051316 | F3a | 300 | | 2 | AM | 68 | 38 | 1.375761283 | 1.020076233 | -0.193007478 | -0.510038116 | 3.534303534 | -18.96551724 | 1 | 0.259031251 |
| 1308071929 | F3a | 300 | | 1 | AM | 152 | 107 | 1.451160743 | 0.655443358 | -0.229330757 | 0.384721353 | -35.2915952 | 7.176391683 | 0.000423821 | 0.518218162 |
| 1308131314 | | 300 | | 2 | AM | 235 | 161 | 1.877212291 | 1.071689749 | -0.291954064 | 0.148897517 | -24.01538929 | 1.217532468 | 0.000075157 | 0.866929025 |
| 1308131732 | | 300 | | 1 | AM | 371 | 262 | 1.701378561 | 1.209591991 | -0.33110299 | 0.306159467 | -26.39646279 | 12.05165574 | 0.000000249 | 0.018102793 |
| 1309012053 | | 300 | | 2 | MF | 75 | 51 | 1.90257267 | 0.464061356 | -0.252760625 | 0.442459072 | -46.90476191 | -0.757575758 | 0.00017951 | 1 |
| 1309051601 | F2f | 300 | | 2 | MF | 222 | 145 | 1.955009282 | 1.257863679 | -0.453104128 | 0.537986762 | -38.74969295 | 17.83783784 | 0.000000002 | 0.005761279 |
| 1309061507 | | 300 | | 2 | MF | 422 | 275 | 2.575029573 | 2.003081902 | -0.55485854 | 0.170614248 | -17.02972384 | 11.13166821 | 0.00000036 | 0.011291782 |
| 1309071812 | | 300 | | 2 | MF | 119 | 67 | 1.864198193 | 0.653828851 | -0.69626231 | 0.593908551 | -55.353902 | 22.82082325 | 0.000000002 | 0.050734755 |
| 1309091051 | | 300 | | 2 | MF | 20 | 14 | Inf | Inf | #NAME? | Inf | -37.5 | 33.33333333 | 0.2 | 0.496503497 |

| Session | Figure | Current µA | Notes | Subject | Target | #Trials_noMS | #Trials_MS | d(S.D) | d(S_MSC02.D_MSC02) | c(S.D) | c(S_MSC02.D_MSC02) | effect-size_[%](S_MSC02-S) | effect-size_[%](D_MSC02-D) | P(S_MSC02-S) | P(D_MSC02-D) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1309091145 | | 300 | | 2 | MF | 42 | 24 | 1.720498203 | 0.047466993 | -0.474928635 | -0.34237286 | -26.62337662 | -27.5 | 0.084155598 | 0.230917874 |
| 1309101346 | | 300 | | 2 | MF | 184 | 129 | 2.500065163 | 1.303646546 | -0.725632069 | 0.072691111 | -25.71536145 | 6.5625 | 0.000008988 | 0.376767668 |
| 1309171637 | | 300 | | 2 | MF | 104 | 74 | 2.403206433 | 1.722022725 | -0.558257811 | 0.206559162 | -21.71945701 | 11.71428571 | 0.003865381 | 0.281446625 |
| 1309211649 | | 300 | | 2 | MF | 19 | 18 | 0.914704517 | 0.927860225 | -0.108596563 | 0.603640411 | -26.98412698 | 22.07792208 | 0.357517483 | 0.595588235 |
| 1309221807 | | 300 | | 2 | MF | 193 | 120 | 2.155107069 | 1.82383731 | -0.268709131 | 0.032750936 | -10.05462615 | 3.688853248 | 0.082891797 | 0.670392988 |
| 1309241404 | | 300 | | 2 | MF | 71 | 51 | 2.630459159 | 1.875879435 | -0.453595459 | -0.029481849 | -12.82051282 | 1.262626263 | 0.181502388 | 1 |
| 1309241541 | | 300 | | 2 | MF | 27 | 20 | Inf | 1.227097233 | Inf | -0.294909252 | 10.38961039 | -37.5 | 0.62254902 | 0.024347826 |
| | | | | | | | | | | | | | | | |
| 1302131221 | F4c | 300 | objects | 1 | AM | 1253 | 421 | 2.939580468 | 2.547262118 | -0.076845037 | 0.424133334 | -13.68265881 | 3.704206242 | 0.000000292 | 0.109259648 |
| 1304021204 | F4e | 300 | objects | 2 | AM | 475 | 213 | 2.80151862 | 2.745377517 | 0.131238348 | -0.010305369 | 1.879432624 | -2.377695526 | 0.695079514 | 0.490378957 |
| | | | | | | | | | | | | | | | |
| 1302131221 | S5ac | 300 | nonround objects | 1 | AM | 363 | 118 | 2.948528967 | 2.62623652 | -0.181459254 | 0.1704216 | -7.769338959 | 2.907369844 | 0.035210958 | 1 |
| 1304021204 | S5bd | 300 | nonround objects | 2 | AM | 131 | 59 | 3.144937552 | 1.993971266 | 0.06007919 | -0.455590548 | -0.79533404 | -24.28355958 | 1 | 0.021936345 |

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**Supplementary Table 2.** Summary of results for Experiment 1. The table summarizes the number of sessions (with more than 100 completed trials) and trials in each face patch, for main experiment comparing effect size of microstimulation on the animal's judgements of facial identity, p: * <= 0.05, ** <= 0.01, *** <= 0.001, n.s.: not significant.

| Monkey | Face patch | # sessions | Total # trials across sessions | Average microstim effect size same | Maximal microstim effect size same | Average microstim effect size different | Maximal microstim effect size different |
|---|---|---|---|---|---|---|---|
| M1 | AF | 1 | 1909 | -44.6 | -44.6 *** | 12.9 | 12.9 *** |
| M1 | AL | 1 | 759 | -68.6 | -68.6 *** | 22.4 | 22.4 *** |
| M1 | AM | 21 | 12612 | -43.8 | -80.2 *** | 12.2 | 32.5 *** |
| M2 | AM | 14 | 7992 | -34.7 | -91.8 *** | 12.5 | 34.5 *** |
| M2 | MF | 8 | 2302 | -28.5 | -55.4 *** | 9.3 | 17.8 ** |
| M1 | ML | 2 | 3986 | -64.6 | -74.6 *** | 19.5 | 20.3 *** |
| M2 | ML | 1 | 575 | -67.2 | -67.2 *** | 12.5 | 12.5 ** |
| M1 | OUT | 2 | 453 | -10.8 | -16.8 n.s. | -8.1 | -16.1 n.s. |

**Supplementary Table 3.** Selected statistics for the performance bars shown in Figs. 2, 4, 5, 7, 8, as well as Suppl. Figs. 2, 3, 5, 6, 9; column four indicates which figure panel a row corresponds to. Same identity trial aggregates are indicated by the S string, different identity trial aggregates by the D string. Microstimulation during cue 2 is indicated by the MSC string, effect size: percentage points difference for correct trials between trials with and without microstimulation, P denotes the significance of the effect size (Fisher's exact test), a value of 0 denotes < 0.0000000005. Columns starting with N- give the number of trials in each of the different trial types. Experiments with more than one stimulus category are stacked vertically to keep the table size constant.

| Session | Subject | Target | Figure | Category | Effect Size [%] (S_MSC-S) | Effect Size [%] (D_MSC-D) | P (S_MSC-S) | P (D_MSC-D) | N-Same Hit | N-Same Miss | N-Diff Hit | N -Diff Miss | N-Same_MSC Hit | N-Same_MSC Miss | N-Diff_MSC Hit | N-Diff_MSC Miss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1302131221 | 1 | AM | F2a | 32faces | -77.56848668 | 27.86954151 | 0 | 0 | 613 | 57 | 497 | 249 | 33 | 204 | 223 | 13 |
| 1303311208 | 2 | AM | F2b | 32faces | -65.31720366 | 27.01907064 | 0 | 0 | 332 | 82 | 283 | 142 | 36 | 206 | 205 | 14 |
| 1302011544 | 1 | ML | F2c | 32faces | -74.62511202 | 18.63787504 | 0 | 0 | 736 | 94 | 683 | 165 | 34 | 208 | 242 | 2 |
| 1304161430 | 2 | ML | F2d | 32faces | -67.22033898 | 12.54295533 | 0 | 0.002294058 | 165 | 12 | 165 | 33 | 26 | 74 | 93 | 4 |
| 1302161303 | 1 | AL | F2e | 32faces | -68.57680251 | 22.42553192 | 0 | 0.000010172 | 236 | 39 | 187 | 88 | 15 | 72 | 85 | 9 |
| 1309051601 | 2 | MF | F2f | 32faces | -38.74969295 | 17.83783784 | 0.000000002 | 0.005761279 | 109 | 9 | 70 | 30 | 37 | 32 | 65 | 9 |
| 1302151316 | 1 | AF | F2g | 32faces | -44.58882611 | 12.93752883 | 0 | 0 | 561 | 88 | 540 | 92 | 113 | 157 | 243 | 4 |
| | | | | | | | | | | | | | | | | |
| 1304172302 | 1 | OUTFP | F4a | 32faces | -4.761904762 | 0 | 0.6843922 | 1 | 57 | 6 | 52 | 13 | 18 | 3 | 20 | 5 |
| 1302131221 | 1 | AM | F4c | 28objects | -13.68265881 | 3.704206242 | 0.000000292 | 0.109259648 | 539 | 35 | 505 | 45 | 146 | 36 | 192 | 9 |
| 1302131221 | 1 | AM | F4d | 32faces | -77.56848668 | 27.86954151 | 0 | 0 | 613 | 57 | 497 | 249 | 33 | 204 | 223 | 13 |
| 1304021204 | 2 | AM | F4e | 28objects | 1.879432624 | -2.377695526 | 0.695079514 | 0.490378957 | 211 | 24 | 224 | 15 | 99 | 9 | 95 | 9 |
| 1304021204 | 2 | AM | F4f | 32faces | -62.90584416 | 36.89104788 | 0 | 0.000001194 | 101 | 11 | 66 | 65 | 18 | 48 | 48 | 7 |
| | | | | | | | | | | | | | | | | |
| 1307181509 | 1 | AM | F4gi | 3faces | -52.55717256 | 20.2467344 | 0.000000075 | 0.09515333 | 57 | 8 | 28 | 25 | 13 | 24 | 19 | 7 |
| 1307181509 | 1 | AM | F4gi | 3apples | -29.03225807 | 16.86567164 | 0.003116073 | 0.140835948 | 54 | 8 | 49 | 18 | 18 | 13 | 18 | 2 |
| 1307181509 | 1 | AM | F4gi | 3citrus fruits | -16.24242424 | 21.47335423 | 0.056075057 | 0.038729844 | 46 | 4 | 45 | 21 | 25 | 8 | 26 | 3 |
| 1307181509 | 1 | AM | F4gi | 3pots | -11.28117914 | 13.63636364 | 0.190729057 | 0.053592911 | 45 | 4 | 57 | 9 | 29 | 7 | 28 | 0 |
| 1307181509 | 1 | AM | F4gi | 3clocks | -9.97983871 | 3.86996904 | 0.196738528 | 0.727205124 | 58 | 6 | 45 | 6 | 25 | 6 | 35 | 3 |
| 1307181509 | 1 | AM | F4hj | 32faces | -52.1773399 | 23.03517152 | 0 | 0.000000646 | 179 | 24 | 130 | 66 | 45 | 80 | 126 | 15 |
| | | | | | | | | | | | | | | | | |
| 1303271654 | 1 | AM | F5ac | 4face_cartoons | -70.9445347 | 30.3030303 | 0 | 0.000454005 | 130 | 9 | 77 | 44 | 7 | 24 | 31 | 2 |
| 1303271654 | 1 | AM | F5ac | 4face_linedrawings | -32.57452575 | 20.13184584 | 0.000006189 | 0.027343378 | 123 | 12 | 79 | 37 | 24 | 17 | 30 | 4 |
| 1303271654 | 1 | AM | F5ac | 4face_mooneys | -40.40977147 | 13.8962963 | 0.000000324 | 0.079107836 | 112 | 23 | 103 | 22 | 20 | 27 | 26 | 1 |
| 1303271654 | 1 | AM | F5ac | 4face_silhouettes | -51.59646739 | 13.65079365 | 0.00000173 | 0.101263743 | 105 | 23 | 79 | 26 | 7 | 16 | 32 | 4 |
| 1303271654 | 1 | AM | F5bd | 32faces | -68 | 13.81147541 | 0.000000005 | 0.093591932 | 48 | 12 | 48 | 13 | 3 | 22 | 37 | 3 |
| 1307291233 | 2 | AM | F5eg | 4face_cartoons | -12.5 | 26.93602694 | 0.109975768 | 0.018442576 | 53 | 3 | 36 | 30 | 23 | 5 | 22 | 5 |
| 1307291233 | 2 | AM | F5eg | 4face_linedrawings | -10.3021978 | -1.786600496 | 0.275434372 | 1 | 51 | 5 | 41 | 24 | 21 | 5 | 19 | 12 |
| 1307291233 | 2 | AM | F5eg | 4face_mooneys | -34.96462264 | 12.06896552 | 0.000112069 | 0.09021437 | 50 | 3 | 51 | 7 | 19 | 13 | 30 | 0 |
| 1307291233 | 2 | AM | F5eg | 4face_silhouettes | -26.84729064 | 34.572697 | 0.000407034 | 0.000628709 | 57 | 1 | 30 | 23 | 20 | 8 | 31 | 3 |
| 1307291233 | 2 | AM | F5fh | 32faces | -30.96381506 | 18.36213669 | 0 | 0.000180501 | 227 | 15 | 147 | 81 | 93 | 55 | 111 | 23 |
| | | | | | | | | | | | | | | | | |
| 1304031338 | 1 | AM | F7ac | 4house_linedrawings | -49.07888522 | 27.37967914 | 0.000002958 | 0.002981192 | 61 | 12 | 54 | 31 | 10 | 19 | 30 | 3 |
| 1304031338 | 1 | AM | F7ac | 4house_cartoons | -47.98534799 | 37.37824675 | 0.00000007 | 0.000151311 | 69 | 9 | 41 | 36 | 17 | 25 | 29 | 3 |
| 1304031338 | 1 | AM | F7ac | 4house_silhouettes | -41.86909582 | 22.88477035 | 0.000011629 | 0.010073837 | 63 | 13 | 52 | 21 | 16 | 23 | 32 | 2 |
| 1304031338 | 1 | AM | F7ac | 4face_mooneys | -65.71428571 | 20.25089606 | 0 | 0.012855399 | 64 | 6 | 69 | 24 | 9 | 26 | 34 | 2 |
| 1304031338 | 1 | AM | F7ac | 4face_mooneys_inverted | -26.55172414 | 24.83552632 | 0.000054788 | 0.008489147 | 84 | 3 | 50 | 26 | 28 | 12 | 29 | 3 |
| 1304031338 | 1 | AM | F7bd | 32faces | -68.997669 | 23.37662338 | 0 | 0.001446435 | 68 | 10 | 59 | 18 | 8 | 36 | 31 | 0 |
| | | | | | | | | | | | | | | | | |
| 1302141229 | 1 | AM | F8 | 32faces | -80.20882772 | 19.66522839 | 0 | 0 | 380 | 50 | 371 | 99 | 12 | 135 | 141 | 2 |
| 1303271654 | 1 | AM | F8 | 4face_cartoons | -70.9445347 | 30.3030303 | 0 | 0.000454005 | 130 | 9 | 77 | 44 | 7 | 24 | 31 | 2 |
| 1304031338 | 1 | AM | F8 | 4face_mooneys | -65.71428571 | 20.25089606 | 0 | 0.012855399 | 64 | 6 | 69 | 24 | 9 | 26 | 34 | 2 |
| 1303271654 | 1 | AM | F8 | 4face_silhouettes | -51.59646739 | 13.65079365 | 0.00000173 | 0.101263743 | 105 | 23 | 79 | 26 | 7 | 16 | 32 | 4 |

| Session | Subject | Target | Figure | Category | Effect Size [%] (S_MSC-S) | Effect Size [%] (D_MSC-D) | P (S_MSC-S) | P (D_MSC-D) | N-Same Hit | N-Same Miss | N-Diff Hit | N -Diff Miss | N-Same_MSC Hit | N-Same_MSC Miss | N-Diff_MSC Hit | N-Diff_MSC Miss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1304031338 | 1 | AM | F8 | 4house_linedrawings | -49.07888522 | 27.37967914 | 0.000002958 | 0.002981192 | 61 | 12 | 54 | 31 | 10 | 19 | 30 | 3 |
| 1304031338 | 1 | AM | F8 | 4house_cartoons | -47.98534799 | 37.37824675 | 0.00000007 | 0.000151311 | 69 | 9 | 41 | 36 | 17 | 25 | 29 | 3 |
| 1304031338 | 1 | AM | F8 | 4house_silhouettes | -41.86909582 | 22.88477035 | 0.000011629 | 0.010073837 | 63 | 13 | 52 | 21 | 16 | 23 | 32 | 2 |
| 1303271654 | 1 | AM | F8 | 4face_linedrawings | -32.57452575 | 20.13184584 | 0.000006189 | 0.027343378 | 123 | 12 | 79 | 37 | 24 | 17 | 30 | 4 |
| 1307181509 | 1 | AM | F8 | 3apples | -29.03225807 | 16.86567164 | 0.003116073 | 0.140835948 | 54 | 8 | 49 | 18 | 18 | 13 | 18 | 2 |
| 1307181509 | 1 | AM | F8 | 3citrus fruits | -16.24242424 | 21.47335423 | 0.056075057 | 0.038729844 | 46 | 4 | 45 | 21 | 25 | 8 | 26 | 3 |
| 1307181509 | 1 | AM | F8 | 3pots | -11.28117914 | 13.63636364 | 0.190729057 | 0.053592911 | 45 | 4 | 57 | 9 | 29 | 7 | 28 | 0 |
| 1307181509 | 1 | AM | F8 | 3clocks | -9.97983871 | 3.86996904 | 0.196738528 | 0.727205124 | 58 | 6 | 45 | 6 | 25 | 6 | 35 | 3 |
| 1302131221 | 1 | AM | F8 | 14nonround_objects | -7.769338959 | 2.907369844 | 0.035210958 | 1 | 214 | 11 | 92 | 10 | 69 | 10 | 27 | 2 |
| | | | | | | | | | | | | | | | | |
| 1303271654 | 1 | AM | S2a | 32faces | -49.35897436 | 7.384910486 | 0 | 0.195888465 | 128 | 28 | 123 | 13 | 17 | 35 | 45 | 1 |
| 1303271654 | 1 | AM | S2b | 32faces | -68 | 13.81147541 | 0.000000005 | 0.093591932 | 48 | 12 | 48 | 13 | 3 | 22 | 37 | 3 |
| 1302141229 | 1 | AM | S2c | 32faces | -13.2664437 | 1.124422026 | 0.038950037 | 1 | 136 | 20 | 121 | 35 | 34 | 12 | 48 | 13 |
| 1302141229 | 1 | AM | S2d | 32faces | -80.20882772 | 19.66522839 | 0 | 0 | 380 | 50 | 371 | 99 | 12 | 135 | 141 | 2 |
| 1304171554 | 2 | AM | S2e | 32faces | -57.12121212 | 15.97262952 | 0 | 0.022418098 | 99 | 9 | 68 | 25 | 19 | 36 | 49 | 6 |
| 1304171554 | 2 | AM | S2f | 32faces | -91.8049271 | 34.51327434 | 0 | 0.000000001 | 112 | 5 | 74 | 39 | 2 | 49 | 67 | 0 |
| 1304111326 | 2 | AM | S2g | 32faces | 0 | -17.46031746 | 1 | 0.55 | 10 | 2 | 8 | 1 | 5 | 1 | 5 | 2 |
| 1304111326 | 2 | AM | S2h | 32faces | -84.65423465 | 26.44300144 | 0 | 0.000000841 | 129 | 14 | 109 | 45 | 3 | 51 | 70 | 2 |
| 1304161430 | 2 | ML | S2i | 32faces | -38.2647386 | 9.412650602 | 0.000007134 | 0.228765611 | 81 | 6 | 70 | 13 | 17 | 14 | 30 | 2 |
| 1304161430 | 2 | ML | S2j | 32faces | -67.22033898 | 12.54295533 | 0 | 0.002294058 | 165 | 12 | 165 | 33 | 26 | 74 | 93 | 4 |
| 1304161430 | 2 | ML | S2k | 32faces | -60.57316065 | 13.77684652 | 0 | 0.001435869 | 174 | 17 | 152 | 32 | 29 | 66 | 80 | 3 |
| | | | | | | | | | | | | | | | | |
| 1307190955 | 1 | AM | S3a | 3faces | -23.64230298 | 14.00076717 | 0.018489572 | 0.207010019 | 62 | 17 | 44 | 35 | 17 | 14 | 23 | 10 |
| 1307190955 | 1 | AM | S3a | 3apples | -18.52564103 | 10.07326007 | 0.013462203 | 0.422625356 | 71 | 7 | 59 | 19 | 29 | 11 | 24 | 4 |
| 1307190955 | 1 | AM | S3a | 3citrus fruits | -0.421200421 | 19.63294921 | 1 | 0.075545628 | 69 | 8 | 42 | 29 | 33 | 4 | 26 | 7 |
| 1307190955 | 1 | AM | S3a | 3pots | -3.147128245 | -4.812030075 | 0.733437275 | 0.448120968 | 74 | 8 | 66 | 4 | 27 | 4 | 34 | 4 |
| 1307190955 | 1 | AM | S3a | 3clocks | -8.760683761 | 12.17320261 | 0.138205726 | 0.136035838 | 74 | 4 | 59 | 13 | 31 | 5 | 32 | 2 |
| 1307190955 | 1 | AM | S3a | 32faces | -30.70175439 | 19 | 0.001294164 | 0.052377865 | 55 | 11 | 33 | 17 | 20 | 18 | 34 | 6 |
| 1307181509 | 1 | AM | S3b | 3faces | -52.55717256 | 20.2467344 | 0.000000075 | 0.09515333 | 57 | 8 | 28 | 25 | 13 | 24 | 19 | 7 |
| 1307181509 | 1 | AM | S3b | 3apples | -29.03225807 | 16.86567164 | 0.003116073 | 0.140835948 | 54 | 8 | 49 | 18 | 18 | 13 | 18 | 2 |
| 1307181509 | 1 | AM | S3b | 3citrus fruits | -16.24242424 | 21.47335423 | 0.056075057 | 0.038729844 | 46 | 4 | 45 | 21 | 25 | 8 | 26 | 3 |
| 1307181509 | 1 | AM | S3b | 3pots | -11.28117914 | 13.63636364 | 0.190729057 | 0.053592911 | 45 | 4 | 57 | 9 | 29 | 7 | 28 | 0 |
| 1307181509 | 1 | AM | S3b | 3clocks | -9.97983871 | 3.86996904 | 0.196738528 | 0.727205124 | 58 | 6 | 45 | 6 | 25 | 6 | 35 | 3 |
| 1307181509 | 1 | AM | S3b | 32faces | -52.1773399 | 23.03517152 | 0 | 0.000000646 | 179 | 24 | 130 | 66 | 45 | 80 | 126 | 15 |
| 1304172302 | 1 | OUTFP | S3c | 3faces | -8.378970427 | -3.16017316 | 0.461256349 | 0.815604896 | 56 | 27 | 51 | 19 | 13 | 9 | 23 | 10 |
| 1304172302 | 1 | OUTFP | S3c | 3apples | -12.51457443 | 3.090623363 | 0.033330896 | 1 | 80 | 3 | 66 | 17 | 26 | 5 | 19 | 4 |
| 1304172302 | 1 | OUTFP | S3c | 3citrus fruits | -19.34883721 | 22.33766234 | 0.008331403 | 0.020074961 | 82 | 4 | 51 | 26 | 19 | 6 | 31 | 4 |
| 1304172302 | 1 | OUTFP | S3c | 3pots | 1.162790698 | -2.662037037 | 1 | 0.392243103 | 85 | 1 | 95 | 1 | 22 | 0 | 26 | 1 |
| 1304172302 | 1 | OUTFP | S3c | 3clocks | -3.603254552 | -2.33384069 | 0.687115149 | 0.469090909 | 83 | 6 | 72 | 1 | 26 | 3 | 26 | 1 |
| 1304172302 | 1 | OUTFP | S3c | 32faces | -4.761904762 | 0 | 0.6843922 | 1 | 57 | 6 | 52 | 13 | 18 | 3 | 20 | 5 |
| | | | | | | | | | | | | | | | | |
| 1302131221 | 1 | AM | S5ac | 14nonround_objects | -7.769338959 | 2.907369844 | 0.035210958 | 1 | 214 | 11 | 92 | 10 | 69 | 10 | 27 | 2 |
| 1304021204 | 2 | AM | S5bd | 14nonround_objects | -0.79533404 | -24.28355958 | 1 | 0.021936345 | 86 | 6 | 37 | 2 | 38 | 3 | 12 | 5 |
| | | | | | | | | | | | | | | | | |
| 1304171554 | 2 | AM | S6ac | 4house_linedrawings | -0.679347826 | 2.727272727 | 1 | 0.769278856 | 63 | 6 | 14 | 56 | 29 | 3 | 5 | 17 |
| 1304171554 | 2 | AM | S6ac | 4house_cartoons | -25.71428571 | 24.70588235 | 0.008209015 | 0.027990954 | 54 | 9 | 24 | 44 | 18 | 12 | 18 | 12 |
| 1304171554 | 2 | AM | S6ac | 4house_silhouettes | -17.59142497 | 36.80555556 | 0.008401914 | 0.000553563 | 60 | 1 | 32 | 40 | 21 | 5 | 26 | 6 |
| 1304171554 | 2 | AM | S6ac | 4face_mooneys | -68.36065574 | 12.29379419 | 0 | 0.053963901 | 60 | 1 | 57 | 10 | 9 | 21 | 37 | 1 |
| 1304171554 | 2 | AM | S6ac | 4face_mooneys_inverted | -43.67201426 | 25.58775287 | 0.000016649 | 0.004425847 | 56 | 10 | 42 | 17 | 14 | 20 | 30 | 1 |
| 1304171554 | 2 | AM | S6bd | 32faces | -91.8049271 | 34.51327434 | 0 | 0.000000001 | 112 | 5 | 74 | 39 | 2 | 49 | 67 | 0 |
| | | | | | | | | | | | | | | | | |
| 1302011544 | 1 | ML | S9a | 32faces MSC10 | -20.19220852 | -1.403379983 | 0 | 0.614406579 | 736 | 94 | 683 | 165 | 176 | 81 | 239 | 63 |
| 1302011544 | 1 | ML | S9a | 32faces MSC02 | -74.62511202 | 18.63787504 | 0 | 0 | 736 | 94 | 683 | 165 | 34 | 208 | 242 | 2 |

| Session | Subject | Target | Figure | Category | Effect Size [%] (S_MSC-S) | Effect Size [%] (D_MSC-D) | P (S_MSC-S) | P (D_MSC-D) | N-Same Hit | N-Same Miss | N-Diff Hit | N -Diff Miss | N-Same_MSC Hit | N-Same_MSC Miss | N-Diff_MSC Hit | N-Diff_MSC Miss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1302011544 | 1 | ML | S9a | 32faces MSC12 | -31.31620823 | -6.936504875 | 0 | 0.016535928 | 736 | 94 | 683 | 165 | 152 | 113 | 198 | 71 |
| 1302131221 | 1 | AM | S9b | 32faces_200ms MSC10 | -19.83261829 | 5.900538608 | 0 | 0.101886215 | 613 | 57 | 497 | 249 | 177 | 70 | 161 | 61 |
| 1302131221 | 1 | AM | S9b | 32faces_200ms MSC02 | -77.56848668 | 27.86954151 | 0 | 0 | 613 | 57 | 497 | 249 | 33 | 204 | 223 | 13 |
| 1302131221 | 1 | AM | S9b | 32faces_200ms MSC12 | -9.637698604 | -17.17960473 | 0.000080287 | 0.000000852 | 613 | 57 | 497 | 249 | 203 | 45 | 133 | 136 |
| 1303311208 | 2 | AM | S9c | 32faces MSC10 | -20.36417689 | 7.578431373 | 0.000015046 | 0.121365772 | 332 | 82 | 283 | 142 | 70 | 47 | 89 | 31 |
| 1303311208 | 2 | AM | S9c | 32faces MSC02 | -65.31720366 | 27.01907064 | 0 | 0 | 332 | 82 | 283 | 142 | 36 | 206 | 205 | 14 |
| 1303311208 | 2 | AM | S9c | 32faces MSC12 | -9.438519734 | 1.636063771 | 0.047031133 | 0.818445011 | 332 | 82 | 283 | 142 | 75 | 31 | 73 | 34 |
| 1302131221 | 1 | AM | S9d | 32faces_50ms MSC10 | -10.35590707 | 4.757199322 | 0.016296025 | 0.436316458 | 257 | 32 | 213 | 95 | 77 | 21 | 68 | 24 |
| 1302131221 | 1 | AM | S9d | 32faces_50ms MSC02 | -40.85041256 | 24.52836637 | 0 | 0.000000284 | 257 | 32 | 213 | 95 | 50 | 54 | 89 | 6 |
| 1302131221 | 1 | AM | S9d | 32faces_50ms MSC12 | -24.4828912 | 5.844155844 | 0.000000479 | 0.338535373 | 257 | 32 | 213 | 95 | 58 | 32 | 60 | 20 |

**Supplementary Table 4.** Selected statistics for the signal-detection theory measures bars shown in Fig. 2h. Same identity trial aggregates are indicated by the S _string, different identity trial aggregates by the D_ string. Microstimulation during cue 2 is indicated by the MSC string; the signal detection measures are given for the detectability of same identities (different identities are effectively treated as noise) without microstimulation (S.D) and with microstimulation (S_MSC.D_MSC); P denotes the significance of the effect size (Fisher's exact test), a value of 0 denotes < 0.0000000005. Columns starting with N- give the number of trials for all different trial types.

| Session | Subject | Target | Category | d' (S.D) | d' (S_MSC0D_MSC) | Criterion c (S.D) | Criterion c (S_MSC.D_MSC) | P (S_MSC-S) | P (D_MSC-D) | N-Same Hit | N-Same Miss | N-Diff Hit | N-Diff Miss | N-Same MSC Hit | N-Same MSC Miss | N-Diff MSC Hit | N-Diff MSC Miss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1302131221 | 1 | AM | 32faces | 1.801223111 | 0.513693857 | -0.471112831 | 1.340584859 | 0 | 0 | 613 | 57 | 497 | 249 | 33 | 204 | 223 | 13 |
| 1303311208 | 2 | AM | 32faces | 1.277114884 | 0.480854723 | -0.209986223 | 1.282192326 | 0 | 0 | 332 | 82 | 283 | 142 | 36 | 206 | 205 | 14 |
| 1302011544 | 1 | ML | 32faces | 2.070566448 | 1.321942213 | -0.174125069 | 1.739065271 | 0 | 0 | 736 | 94 | 683 | 165 | 34 | 208 | 242 | 2 |
| 1304161430 | 2 | ML | 32faces | 2.459825744 | 1.0931616 | -0.262491306 | 1.189926205 | 0 | 0.002294058 | 165 | 12 | 165 | 33 | 26 | 74 | 93 | 4 |
| 1302161303 | 1 | AL | 32faces | 1.539885097 | 0.361516264 | -0.302243749 | 1.125427723 | 0 | 0.000010172 | 236 | 39 | 187 | 88 | 15 | 72 | 85 | 9 |
| 1309051601 | 2 | MF | 32faces | 1.955009282 | 1.257863679 | -0.453104128 | 0.537986762 | 0.000000002 | 0.005761279 | 109 | 9 | 70 | 30 | 37 | 32 | 65 | 9 |
| 1302151316 | 1 | AF | 32faces | 2.15596015 | 1.933895824 | -0.022354344 | 1.172632834 | 0 | 0 | 561 | 88 | 540 | 92 | 113 | 157 | 243 | 4 |